DOCUMENT RESUME

ED 396 742 IR 017 955

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TITLE Designing CBE for Continuing Professional Education.
PUB DATE 96
NOTE 7p.; In: Learning Technologies: Prospects and Pathways. Selected papers from EdTech '96 Biennial Conference of the Australian Society for Educational Technology (Melbourne, Australia, July 7-10, 1996); see IR 017 931.
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Accountants; Authoring Aids (Programming); *Business Education; *Continuing Education; Distance Education; Foreign Countries; Independent Study; Learning; *Licensing Examinations (Professions); *Multimedia Instruction; Postsecondary Education; *Professional Training; Program Development; User Needs (Information)

ABSTRACT

Deakin Australia (DA) CBE (Continuing Business Education) programs are designed for use in conjunction with print and audio materials which are distributed as distance learning packages to business studies graduates working or planning to work as accountants, who are enrolled in the professional licensing program run by the Australian Society of Certified Practising Accountants (ASCPA). This paper considers DA's approach to CBE in relation to a range of CBE issues: learning context, the temptation to overutilize the capabilities of computer authoring tools, learning styles and motivation, maximization of the value of CBE, and approaches to authoring. Producing CBE as a part of a package of study materials is a vastly different issue than producing a CBE program to be used as a stand alone course of study or an independent reference resource, and it is important to limit the scope of the program for the same reason. Students have a wide range of learning styles and motivation; the CBE instructional designer's role is to provide attractive study options within both computer and paper learning contexts. Current DA CBE projects vary in structure, content, and style, but have certain consistent elements that are based on user feedback from programs in the last two years: (1) programs are applications of theory and/or practical skills practice rather than presentation of learning content, which is contained in printed study guides supported by audio cassette tutorials; (2) programs are modular and allow users to tailor study sessions to their own requirements--content is organized in case studies with randomizing programming techniques to provide unique problems for user analysis; and (3) programs provide several levels of help for user consultation plus detailed feedback on program tasks. A program with an analytical treatment of professional ethics is underway. In the Deakin Australia CBE instructional environment, two guiding principles have emerged: "small is beautiful" and "will this help candidates to prepare efficiently for the examination." (SWC)

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# Designing CBE for continuing professional education

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ED 396 742

*Deakin Australia (DA) started designing and producing CBE programs in 1994. Five programs had been completed by the end of 1995. A further four programs will be released during 1996.*

*Programs are designed for use in conjunction with print and audio materials which are distributed as distance learning packages to business studies graduates enrolled in the professional licentiate program run by the Australian Society of Certified Practising Accountants (ASCPA).*

*An approach to design and production of programs has evolved over the last two years which takes account of the experience to date. DA's approach to CBE is considered below in relation to a range of CBE design issues.*

## Overview of Deakin Australia CBE programs

DA programs completed to date or currently in development are briefly outlined below.

*Statement of Cash Flows:* This program combines instructional sequences with active spreadsheets which enable users to prepare journals, ledgers, worksheets, reconciliations and statements of cash flows and accompanying notes.

*Taxation Training Program:* A simulated interview takes place between a taxation agent (the user) and a client (the computer). An active spreadsheet is used by the taxation agent to interrogate the client data base in order to complete a taxation return.

*Foreign Currency Translation:* A series of 29 case studies is presented relating to translating transactions denominated in a foreign currency. Active spreadsheets and a randomising function are used to generate case study data.

*Principles and Applications of Risk Management:* This program tests the mastery of a range of financial instruments. Mastery of formulae and calculation skills is tested by a bank of short test problems. Understanding of the purpose and operation of instruments is tested by analysis of longer case study scenarios.

*Computer-Based Testing:* A bank of multiple choice test questions is available for review of course content. Questions may be ordered as tests of particular content areas (over a variety of test lengths) or as comprehensive examinations of course content (again, over a variety of timings). Feedback includes commentary on correct and incorrect test choices and a range of diagnostic statistics of test and examination performance.

*Professional Ethics:* Use of tabs program involves case study analysis of ethical principles and decision making frameworks. Issues are presented for progressive analysis by users in consultation with a comprehensive data base of instructional resources.

*Management Accounting:* The user is presented with a data base of problems based on material contained in the printed study guide. Individual problems require an appropriate course of action to be selected from four options. The program analyses the response and provides feedback, including a random challenge feature which requires the user to review and reselect the required course of action. Problems are presented at four levels of responsibility in a mythical company.

*Cash Flow Statements:* Revised version of the earlier cash flow program. The program presents

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format. The user is required to reconstruct the journal entries used to produce the cash flow statement. Hints are available indicating problems and corrections to be made.

*Foreign Currency Translation (2):* Companion to the first foreign currency program to address case study problems in the translation of financial statements denominated in a foreign currency.

This paper also draws on the results of the evaluation of a further CBE program, *Consolidated Financial Statements,* produced by the University of Queensland in conjunction with the ASCPA.

## CBE design and production issues

### 1 CBE and the learning context

Programs produced by DA form part of the learning materials for the continuing professional education of graduates working, or planning to work, as accountants. An overwhelming fact of life for these CPA Program candidates is a chronic shortage of time for study. Candidates typically are in their 20s, work full time, and have a range of commitments besides their part-time study of the CPA Program by distance education.

While the problem of scarce study time did not come as a surprise and was certainly considered in the design of CBE materials, there was some misinterpretation of the impact the problem would have on candidate responses to the initial CBE programs. DA's planning hypothesis was that CBE material would be carefully targeted to content which could effectively harness and capitalise on the power of the computer and would avoid the more discursive content which was best presented as print or audio discussion. This would produce learning economies and would reduce the overall study time required for the semester study program.

This hypothesis hit the spot beautifully for some candidates.

> It was excellent–keep developing it. Make all segments available through interactive learning–it's so much easier. I learnt cash flows 'inside out' in PK 5 hours it would have taken me 5 days on paper. THANK YOU. (Cash Flow)

Unfortunately, for many candidates, the shortage of study time ruled out the allocation of the time necessary to reach a threshhold level of familiarity with the program to obtain any learning benefit.

> Given time constraints of work etc. I was unable to really feel I got through enough to make the best use of the tool. I think it is a very good tool but tries to achieve too much. A simpler version would enable more people to complete the whole and see how it really fits together. (Computer-Based Testing)

> I thought my time better spent learning the content of the course rather than dilute my efforts by using the program although perhaps with more use it would have been of benefit. (Computer-Based Testing)

The design thinking had not anticipated the preference for known study solutions where a restricted study routine led into a print-based, end-of-semester examination. Insufficient attention was also paid to the strong focus of many candidates on obtaining the credential. In hindsight, it is clear that a rather heroic assumption was tacitly adopted in producing the initial programs that candidates would be enthralled by the brilliance of each program and motivated to increase the hours devoted to using CPA Program CBE material. As a consequence they would reap the reward of educational riches in their exploration of this stimulating academic Shangri La. In fact, some did. But many were unable or unwilling to find additional study hours and, instead, made hard-nosed decisions about requirements to gain the professional credential.

Our conclusion was that producing CBE as part of a package of study materials is a vastly different kettle of fish to producing a CBE program which is to be used as a stand alone course of study or an independent reference resource.

The question of limiting the scope of a CBE program leads neatly into the issue of working with CBE authors.

## 2 The 'Just a bit more' syndrome

Designing CBE is a beguiling and seductive pastime. The authors of the initial Deakin Australia CBE programs were extremely competent professionals and experienced teachers who were also enthusiastic about experimenting with this new (to them) teaching medium. Initial program plans were quite ambitious. As scripting proceeded and authors learned more about the capabilities of the authoring tool used by the programmers, there was strong but subtle pressure to push the scope of the program further, and further, then a bit more.

Each innovation was quite clever and made the power and versatility of the program more impressive. These enhancements were enthusiastically adopted. However, they were not considered from the point of view of the candidate struggling to find the time to prepare for the segment examination.

The 'just a bit more' syndrome is an insidious problem when designing CBE within the confines of a crowded study program.

## 3 Learning styles and motivation

Evaluations of programs produced to date have confirmed the fact that any population of students will express preferences across a range of learning modes. Some CPA Program candidates are hooked on paper and will remain so: others were Pollyannas for CBE.

> I felt the printed materials were adequate in giving me the necessary understanding. (Computer-Based Testing)
>
> Difficult to read all theory on computer screen as your eyes get sore and one cannot sit in front of computer reading for long periods of time. You could only read it on screen whereas on paper you could highlight, underline it. (Cash Flow)
>
> Overall, the program is excellent. It is the best computer based training program I have used to date.... Using the program does make the learning more interesting. I was surprised that I could sit for several hours at a time in front of the PC using the program without realising just how long I had been doing it for. (Cash Flow)
>
> A good supplement for practical training but not sufficient to take place of printed materials study. (Tax)
>
> I found that computer program was of no use to me because: did not suit my study methods–side notes in text, highlighting and summaries; screen display was limited but unavoidable. With printed matter it is possible to refer simultaneously to several different pages; having to wait while program moved backwards interrupted thought train ... I would not be prepared to study a subject in which some or all of a module was totally computer based. Thank you for the opportunity to test the program, however having previously completed all my study using printed material, it was unfortunately of little use to me. (Cash Flow)
>
> The interactive nature ie the extensive help functions, ability to only involve 'explanations' when required and the paragraph tabs meant you could easily get more info in just the areas you need. (Cash Flow)
>
> Since the CPA courses are predominantly self taught and self motivational, the work tends to be tedious. I personally think the program was more interesting and fun and I preferred to study off the computer as opposed to reading 30 pages of text and trying to answer tutorial questions. (Cash Flow)

While we need to accept the proposition that learning styles do vary, there remains an important role for the instructional designer. Between the extremes of the Luddites and the Pollyannas lies a large number of people whose attitude to CBE is either Uncommitted' or weakly pro or con. The task

for the instructional designer is to maximise the motivation of these in-between educational consumers by providing attractive study options within particular learning contexts.

> One important variable in the learning context is whether or not the study program includes a formal examination. If it does, the form of the examination is significant. CPA Program candidates frequently comment in evaluations that because they face an end-of-semester, paperbased examination, they prefer paper-based preparation for the examination - particularly where study time is at a premium.
>
> I found the program to be very good. If the exams were not to be open book I would have worked mainly through the computer assisted package. (Tax)
>
> The exam is not done on computer. I preferred the printed info as I don't like using the computer for everything. Find it easier to learn from printed info and could do so in the ease of my home... (ComputerBased Testing)
>
> I think that the CBT make learning more interesting. However, I only made limited use of CBT because it is less time economy than reading the hard copy materials. (Computer-Based Testing)
>
> Time was a major constraint. Since printed material was provided, I used it instead of the CBT. (ComputerBased Testing)
>
> I liked using the programme but feel that, unless part of the assessment is computer based, its application is fairly limited. (Consolidations)

## 4 Maximisation of the value of CBE

A question discussed in the professional literature is, how is CBE most effectively deployed? That is, what do computers do best in relation to other instructional media and, therefore, where should CBE resources be concentrated? Viewpoints range across a wide continuum (for example: Amthor, G.R. (1991) or Zalakos, V. (1991) 2 Ellis, D (1994)).

The multimedia lobby argues that the processing power of the computer is best used by the preparation of simulation and problem-solving applications employing powerful manipulative devices such as embedded spreadsheets and sophisticated data bases with hyperlinks to multimedia resources. This viewpoint shuns narrative text CBE material as electronic page turning which is tedious and better presented on paper.

On the other hand, Dan Ellis of Queensland University of Technology (1994) questions the credentials of multimedia CBE pointing to the expense and long lead times for production of multimedia which is not able to demonstrate an improvement in learning effectiveness of multimedia blockbusters in relation to humble (and possibly tedious) text-based CBE.

> The DA experience is not definitive. We have produced programs which reflect values at both ends of the continuum (although our simulation-style programs have consisted of text and graphics and have *not* included audio or video files). Feedback from evaluations has included strong (though not universal) reaction against 'electronic page turning' and broad (though not universal) endorsement of simulation activities.
>
> It is much easier and more enjoyable to complete a tax return via this program than reading four pages of data in a CPA module. (Tax)
>
> Reading from a computer screen sucks. I don't think it is the right medium for reading anyway. Examples yes, Reading no. (Consolidations)

> Leave theory and long text to the programme folders, use computer more for practical illustrations and case studies which may be interactive and allow student to solve problems, do entries etc. (Cash Flow)

> The topics were covered quite well with practical examples being more suitable to computer use. I found it difficult to follow the theory topics, especially considering I like to highlight and underline text. (Cash Flow)

These responses are not particularly surprising. What was more surprising (in the first set of evaluations) was the reaction against blockbuster programs irrespective of the nature of the programs. Accordingly, while candidates overall preferred to use the computer for practical applications of CBE rather than presentation of theoretical instruction, this seemed to be subsidiary to the issue that to be valuable at all, CBE had to be presented in digestible chunks and capable of productive study use after a very brief program orientation. In other words, the best programs were those that could benefit the user irrespective of whether he or she devoted 2 or 22 hours to the program over 2 or 22 separate study sessions.

Having made this point, it must also be said that some users were impressed by the blockbuster programs and indicated that they anticipated using the programs extensively as reference resources quite independent of their CPA Program studies. We are, therefore, retaining the blockbusters as independent skills programs within the ASCPA's overall professional development activities, but reshaping those CBE programs which are to be offered within the CPA Program.

### 5 Approaches to authoring

DA has tried several approaches to the way that authors script program content.

The initial system emphasised a large team approach and detailed preparation of a development blueprint. A series of meetings was held to map out the fine detail of program structures and functions. The outcome of this process was to be a detailed coded flow chart which would allow programming to proceed smoothly to faithfully reproduce the blueprint. This system was quickly abandoned when authors became bogged down in the mysteries of the flow chart and the coding system. Development then proceeded according to an evolutionary model whereby authors would submit scripts as prose content for display with prose directions regarding program functionality. Programmers would then interpret the script and return programmed sections for review and refinement by the authors. The cycle was repeated a number of times until programmers and authors were happy with the result. This approach seemed to work well, although, in hindsight, this probably reflected the fact that the programmers had had considerable prior experience in CBE business finance applications. Another by-product of this approach was a considerable dose of 'just a bit more' syndrome, as explained earlier.

When new programmers replaced the departed first generation of DA programmers, the evolutionary approach to scripting became unwieldy and inefficient. Scripting became unduly protracted, relying increasingly on complicated email, fax and phone communication. Programming became more stop/start and frustration levels of all team members rose.

The current scripting model has reverted more to the initial blueprint approach. However, initial planning meetings and related discussion and documentation is carried out in everyday language rather than complicated code and is interpreted and referred back to the planning team by programmers for confirmation as a progressively-developed design specification. No programming is undertaken until the design specification has been finalised on paper. Scripting takes place in prose after agreement on the design specification and according to scripting layouts agreed with the programmers. Blood pressure seems to be much more under control since this system has been adopted.

## Current developments

CBE projects currently in development reflect the accumulated experience of programs developed over the last two years. While the current programs vary in structure, content and style, certain elements are consistent:

1 Programs are essentially applications of theory and/or practical skills practice rather than presentation of learning content. Learning content is contained in the printed study guides supported by audio cassette tutorial discussion.
2 Programs are modular and allow users to tailor study sessions to their own requirements. Content is organised into case studies and randomising programming techniques provide a supply of unique problem situations for user analysis.
3 Programs provide several levels of help for user consultation plus detailed feedback on program tasks.

One of the current developments is a program which provides an analytical treatment of professional ethics.

## Professional Ethics

The ethics program relies heavily on screens of textual information. However, an effort has been made to confine this text to a minimum necessary to analyse case study essentials as a lead-in to a more detailed interrogation of the ethics data base on which the main program is built. In this program, the computer is being used to overcome key problems in the traditional print presentation of the ethics material. Candidates have been overwhelmed by the teaching content in printed form because it is conceptually difficult and qualitatively different to the academic disciplines most candidates have encountered in under-graduate study programs. At the same time, authoring the print material has been difficult because a balance has been needed between providing a challenging array of resource material and keeping the whole sequence manageable for the 'average' candidate.

The computer program on ethics has adopted a case study approach in conjunction with a comprehensive data base of support material. Candidates may select a case and use the case framework as a means of exploring the data base. Candidates may explore in as much or as little depth as they choose in whatever study sequence they choose. The computer program, we believe, will serve to encourage users to make better use of the printed content on ethics presented in the study guide.

## The Deakin Australia experience of CBE

While clear directions have been suggested by the CBE development work done at Deakin Australia, it is difficult to derive definitive rules for the design of CBE. The computer is an extremely flexible teaching device and is able to be applied in a range of settings to enhance learning opportunities. In the Deakin Australia CBE instructional environment, two guiding principles have emerged: 'small is beautiful' and, more generally, 'will this help candidates to prepare efficiently for the examination.'

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